What is claimed is:

Claim 1. An apparatus for the printing of functional toners on a flat glass plate, said apparatus comprising:

a. an electrostatic printing plate (10) including a polymer layer (52) bonded to an electrically conducting substrate (54) that is electrically grounded;

b. a first corona unit means (12) for electrically charging said electrostatic printing plate with ions from a corona discharge thereby sensitizing it and defining charged and uncharged areas;

c. a liquid development unit (16) which is electrically biased to deposit functional toner particles (50) on said uncharged areas of said electrostatic printing plate;

d. a transfer station (48) in which said flat glass plate (26) is moved into close proximity to said electrostatic printing plate (10), but not touching;

e. means (25) for filing the mechanical gap between said electrostatic printing plate and said glass plate with a clear toner diluent (44); and,

f. a second corona unit means (30) located near said glass plate (26) but away from said electrostatic printing plate (10) and which is electrically connected to a high voltage power supply (31) for creating a corona discharge which sprays free charges on said glass plate (26) and which creates an electrical field (23) that causes said toner particles (48) to transfer across the fluid filled gap (42) in an orderly manner.

Claim 2. The apparatus of claim 1 further comprising;

g. mechanical adjustment capability means located on said transferred corona unit including mechanical shutters (32) for controlling the exact position where toner migration from said printing plate (10) to said glass plate (26) occurs;

h. cleaning unit means (36) for removing residual toner particles from said printing plate (10);

i. a drying station (27) where warm air is provided to dry said glass plate after imaging; and,

j. support means (28) for supporting said glass plate (26) on it's edges so that said free charges in said glass tightly bind toner particles to the surface of said glass plate (26) after transfer.

Claim 3. The apparatus of claim 1 further comprising:

k. positive phototool means for exposing said electrostatic printing plate to actinic radiation in order to cross-link the non-imaged elements of said printing plate (10) while the image elements are unexposed and not cross-linked.

Claim 4. The apparatus of Claim 1 wherein said discharge areas of said printing plate (10) develop said toner particles.

Claim 5. The apparatus of Claim 4 wherein the polarity of said corona ions is identical to that of the toner particles in the liquid toner (50).

Claim 6. The apparatus of Claim 1 wherein said developer unit (16) includes an electrode (18, 22) which is electrically biased to a value approximately equal to the charged voltage of said printing plate (11).

Claim 7. The apparatus of Claim 1 wherein said receiving glass plate (26) is dried of excess liquid (46) by air (27) at substantially room temperature which is blown thereover to partially fix said toner.

Claim 8. The apparatus of Claim 1 wherein said toner comprises at least three functional particle toners.

Claim 9. A method for producing charged areas on an electrostatic printing plate which is to be developed with toner particles, by the steps of:

a. exposing said plate with a negative photo tool;

b. using corona discharge (56) to generate ions of the opposite polarity to the toner (50); and,

c. biasing the developer unit electrode to approximately 100 volts more than the image plate (11) voltage, in the background areas.

Claim 10. An apparatus (134) for the printing of functional toners on a flat glass plate, said apparatus comprising:

a. a flat electrostatic printing plate (102, 134) including a polymer layer (52) bonded to an electrically conducting substrate (54) that is electrically grounded;

b. a first corona unit means (114) for electrically charge said flat electrostatic printing plate (102) with ions (110) from a corona discharge thereby sensitizing it and defining charged and uncharged areas;

c. a liquid development unit (112) which is electrically biased to deposit functional toner particles on said uncharged areas of said flat electrostatic printing plate (102);

d. a reverse roller unit (120) means for mechanically removing excess diluent liquid from the developed plate (102);

e. a depress corona (122) to compact the toner particle pile before transfer;

f. a transfer station (124) in which said flat electrostatic printing plate (102) is moved in close proximity to a flat receiving glass substrate (124);

g. means (126) for filling the mechanical gap between flat printing plate (102) and flat receiving glass (124) with clear toner diluent (126); and,

h. a second corona unit means (128) located near said glass plate (124) but away from said electrostatic plating plate (102) which is electrically connected to a high voltage power supply for creating a corona discharge which sprays free charges on said glass plate (124) and which creates an electrical field that causes said toner particles to transfer across the fluid filled gap in an orderly manner.

Claim 11. The apparatus of Claim 10 further comprising;

i. electronic control mean (130) for providing adjustable time delays between each step of the process to achieve optimum image quality; and,

j. means more resistive than the glass (124) for supporting said glass plate (124) on its edges (132) so that said free charges in said glass (124)

tightly bind toner particles on the surface of said glass plate after transfer, without distortion due to edge charge leakage.

Claim 12. The apparatus of claim 10 wherein the diluent fluid filling the gap (42) has an electrical conductivity from 0.15 to 100 pico siemens per centimeter.

Claim 13. The apparatus of Claim 10 wherein said printing plate (102) comprises a reimagable photoreceptor plate (134, 102), comprising an amorphous selenium layer, which is sensitized by a corona discharge (110) and imaged by an optical means, such as a scanned laser beam (111).

Claim 14. The apparatus of Claim 10 wherein a glass particle toner (203) is transferred to said glass plate (200) and the toner image (203) is dried with warm air to partially set the resin coating the glass particles and wherein successive layers of toner (203) build up a structure of a predetermined height.

Claim 15. The apparatus of Claim 10, wherein a palladium catalytic toner (224) is imaged on a relieved, or ribbed, glass panel (200) and subsequently plated with a metal to generate an electrode structure (204).

Claim 16. The apparatus of Claim 10 wherein a phosphor particle toner (230) is printed in a manner to coat a relieved structure (230) with a ribbed glass panel (200) having electrode lines (204) between said ribs (202).

Claim 17. An apparatus for the production of color for the black matrices on a flat plate (301) of said apparatus comprising:

a. a color filter plate (301) with an electrical conductive coating (302) and color mosaic pattern (304), which coating (302) is electrically grounded;

b. a corona unit (308) to charge the mosaic pattern (304) with charges (310); and,

c. liquid toner (312) which develops in the uncharged areas of plate (301), the regions between the color mosaics (304),

wherein the polarity of the toner particles (312) is identical to the polarity of the corona generated charges (310).

Claim 18. The apparatus of Claim 17 further comprising:

d. means (314) for drying and reflowing the toner image (312) on said coated glass plates (301);

e. means (306) for electrically grounding the conductive layer under said toner image; and,

f. means (308) for corona charging said toner image (312);

wherein said liquid developer unit deposits black toner particles in said uncharged areas or the bare regions of said plate between said color mosaics (304).

Claim 19. The apparatus of Claim 17 wherein said glass coating (302) is 0.5μ to 25μ thick.

Claim 20. The apparatus of Claim 17 wherein said glass coating (302) yields a resistivity of 1 ohms per square to 10^{10} ohms per square.

Claim 21. The apparatus of Claim 17 wherein said glass coating (302) is preferably in the range of 10^{1} to 10^{8} ohms per square.

Claim 22. An apparatus for the production of phosphor patterned glass plates comprising:

a. a glass plate (330) patterned with a metallic, conductive materials (332, 334) on its inside surface to conduct electronic charges to ground;

b. means to rest said plate (301) on an electrically grounded plate (336), with the conductive patterns (332, 334) facing in an outward direction;

c. means (338) for conducting said patterned conductive surface (332, 334) to a high voltage power supply (338) thereby generating an intense electric field between the patterned surface (332, 334) and said grounded plate (336);

d. means (341) for bringing liquid toner in contact with said patterned surface (332, 334) thereby depositing toner particles (340) with a charge of the same polarity as the voltage connected to the patterned surface (332, 334), in areas adjacent to said patterned surface (332, 334), but not on it;

e. means (342) for drying said liquid toner image; and ,

f. means (344) for reflowing said toner (340) by means of heat.